

# **EPA R6 Dive Team Operations Report**

**San Jacinto Waste Pits  
Channelview, TX  
December 9-10, 2015**

## **BACKGROUND**

The San Jacinto River Waste Pit Site history has been documented in several documents prepared for, submitted to, and approved by the EPA. In brief, paper mill wastes were disposed in impoundments about 14 acres in size at the site in the 1960's resulting in dioxin and furan contamination in the adjacent waterbody of the San Jacinto River. The impoundments/waste pits are situated on a 20 acre parcel immediately north of Interstate Highway 10 on the west bank of the river.

Pursuant to an EPA-issued Unilateral Administrative Order, International Paper Company (IPC) undertook a Time Critical Removal Action (TCRA). As a central component of that action, IPC and MIMC and McGinnes Industrial Maintenance Corporation (MIMC) implemented action to stabilize the waste pits and to install the TCRA Cap. The original 1966 boundaries of the northern impoundments/waste pits and impacted area extend into the current basin of the San Jacinto River, and thus a portion of the cap is underwater in depths extending to a maximum of approximately 16 feet. The TCRA Cap is designed to prevent the migration of dioxins and furans from the historic boundaries of the northern impoundment into the San Jacinto River and its sediments.

## **INTRODUCTION**

This report covers the first of several anticipated, interrelated diving operations at the San Jacinto River Waste Pits Superfund Site in Harris County, Texas where Interstate Highway 10 (I-10) bridge crosses the San Jacinto River. This first diving operation is to serve two primary purposes: (1) investigate the physical integrity of the multilayer impermeable cap installed over waste pits as part of the Time Critical Removal Action (TCRA); hereinafter referred to as the "TCRA Cap", and (2) to implement and validate procedures that will be used for the installation and retrieval of TCRA Cap pore water sampling devices during the full investigation of ongoing performance of the TCRA Cap (dive operations 2 through 4).

## **PURPOSE**

TCRA Cap installation was completed in July 2011. The current investigation (and the portion assisted by the U.S. EPA dive teams from Region 6 and ERT) is designed to safely assess ongoing TCRA Cap integrity and performance as measured by the continued physical integrity

of the cap and its boundaries and also the absence of detectable migration of dioxin and furans from the waste pit beneath the Cap and into the San Jacinto River.

Divers will perform a cursory Cap inspection, using visual and tactile means, particularly at the Cap perimeter to determine if the hard armor (gravel and stones placed over the cap) are remaining in place and if the boundaries are maintaining integrity as installed. Diver observations will be supplemented by GPS coordinates and depth measurements, and by side Dual-Frequency Imaging Sonar or Acoustic Camera. Visibility is anticipated to be very poor, but an attempt will be made to collect photographic images.

The entire investigation will entail placement and retrieval of Solid Phase Micro-Extraction (SPME) sampling devices designed to passively collect dioxin and furan pollutants in the pore water of the interstitial spaces of the hard armor cover of the Cap. This first diving operation will focus simply on verifying effective techniques for installing, securing, and then retrieving such sampling devices.

## **ACTIVITIES**

**Tuesday 12/8/15.** Members of the EPA Dive Team; Alan Humphrey (ERT), Brandi Todd (R6), Valmichael Leos (R6), Bill Luthans (R6), and Nick Gannon (R6) mobilized to Houston, TX and acquired supplies for on-site activities. The Dive Team met briefly to discuss logistics for the following day's activities.

**Wednesday, 12/9/15.** EPA divers, RPM, RPs and BESI personnel mobilized to the Riverside Inn Marina located near the site. A 20-foot aluminum boat was launched by BESI. Following equipment loading, a Health and Safety meeting, and travel via boat to the site (approx. 1 mile), primary and backup diver preparations began on board. All dive activities followed procedures outlined in the San Jacinto Waste Pit Dive Plan and EPA Dive Safety Plan. At 12:25 the first R6 tethered diver entered the water to begin the Cap inspection. The diver, directed by topside staff, descended to the riverbed and reported presence or absence of rock, approximate depth of silt, and detectable slope. The diver utilized a portable T-bar to assess depth of silt and presence or absence of rock.

**Thursday, 12/10/15.** Again, EPA divers, RPM, RPs and BESI personnel mobilized to the Riverside Inn Marina. In addition to tethered diving operations, a side Dual-Frequency Imaging Sonar and a calibrated river bed probe were utilized from the boat to assess condition of the Cap. Thursday operations included the testing of equipment and procedures for future Solid Phase Micro-Extraction (SPME) sampler placements. A R6 diver, equipped for shallow water wading and supported by a Jon boat, accomplished the shallow water placement and a tethered diver accomplished the deep water sampler placement, marking, and retrieval.

Post dive activities included de-con, equipment storage and shipping. Staff demobilized to Dallas, New Jersey and Houston.

## OBSERVATIONS

Areas of the Cap inspected by the dive team are described as areas A, B, C, and D for ease of discussion (see Map).

### Area A

Location A.1 - On Wednesday, 12/9, the tethered diver entered the river at location A.1 on foot in an attempt to walk into deeper water. The diver was not able to walk because he sank into the silty bottom in the area immediately adjacent to the boat. Hard rock was not encountered at the river bottom in the immediate area of boat and diver. Diver was relocated to A.2 On Thursday, 12/10, the team returned back to this location to perform further investigation. In order to better define the area where rock was not present, a calibrated plastic pole (probe) operated from the boat was used to determine the presence/absence of rock at 4 GPS coordinates (see Map). Probe locations indicate the hole is at least 17 ft across.

Location	Longitude	Latitude	Observations
probe 1	-95.062986	29.795421	Rock not present to a depth of at least 6 ft
probe 2	-95.063084	29.795416	Rock Present
probe 3	-95.063038	29.795428	Rock not present to a depth of at least 6 ft
probe 4	-95.062956	29.795437	Rock Present

After penetrating multiple feet into the sediment, the white plastic pole was covered with a thick, grey, sludge-like material when brought to the surface (Image 1, Image 2, and Image 3). This material is not similar in nature to the flocculent sediment identified at other areas of the cap.



**Image 1:**  
Insertion of probe adjacent to location A.1 where rock is not present.

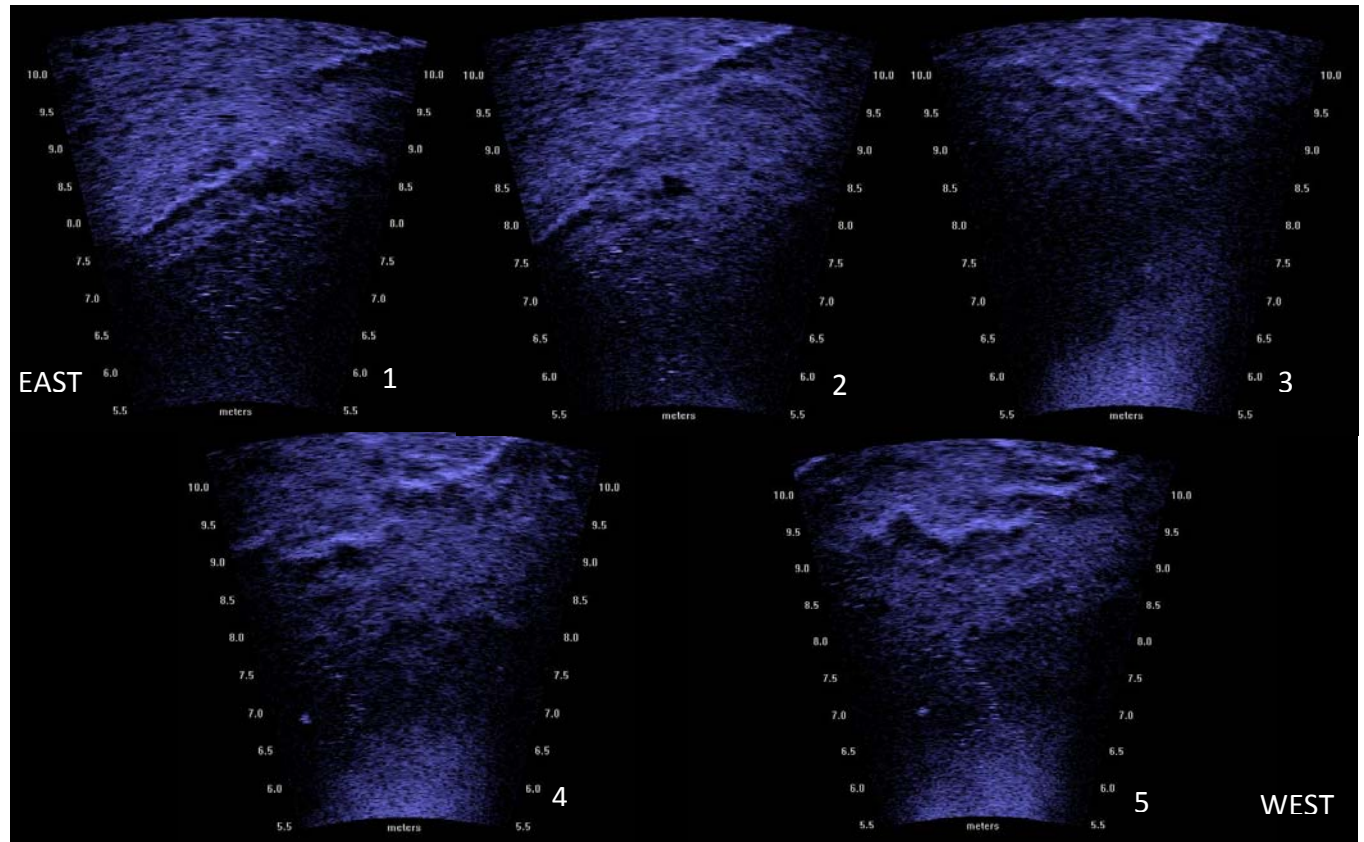


**Image 2:**  
Probe brought to the surface after sediment penetration adjacent to location A.1.



**Image 3:**  
Thick, grey, sludge-like material on probe after sediment penetration adjacent to A.1.

Imaging sonar was utilized in this area in an attempt to visualize the area of deficiency. This area was not identifiable via sonar, but other areas of interest were identified based on changes in color within the sonar image (Image 4 and Map). A tethered diver was used to physically inspect these areas. Rock was found to be present throughout these areas. Two factors introduced difficulty during sonar operation. Wind-driven movement of the boat distorted sonar imagery. Usefulness of the sonar was limited to areas that were covered with little to no sediment. This condition existed in areas of the cap with sloping bathymetry.



**Image 4:** Sonar Images of armored cap. Appearing in order from East to West and top of the image pointing South towards the shoreline.

Location A.2 – Diver noted a pavement-like surface at this location and a slope of approximately 30°.

Location A.3 – Diver noted a pavement-like surface beneath a flocculent layer of sediment at this location and a very slight slope.

Summary Area A – Diver noted a pavement-like surface at all locations except adjacent to A.1. Rocks were estimated to be greater than 12 inches in diameter. Diver noted a slope of approximately 30° within Area A. Depth of flocculent sediment increased as the slope decreased. Depth of flocculent sediment was approximately 24” at the bottom of the slope.

## **Area B**

Location B.1 – Diver identified a ridgeline of rock at this location. The ridgeline is approximately 5-6 ft wide.

Locations B.2-B.3 – Diver noted a rocky floor at these two shallow locations. Rocks were estimated to be greater than 12 inches in diameter.

## **Area C**

Location C.1 and C.2 – Diver identified a ridgeline of rock at this location. The surrounding area was covered in a layer of rock. Rocks were estimated to be greater than 12 inches in diameter.

## **Area D**

During shallow water wading for the purpose of testing equipment, the Dive Team investigated Area D with a T-bar. A rock cover was encountered at all locations investigated in Area D.

An estimated 76,474 sq feet or 14.25% of the total underwater cap area was investigated by the Dive Team during this operation.

## **SAFETY CONCERNS and RECOMMENDATIONS**

At the completion of this project, a review of the procedures and equipment was conducted. There were no malfunctions of the dive gear to report. This includes diver full face masks, imaging sonar, dry suits, and hard wired communications gear. The tender, who also served as the standby diver, was not required to enter the water to assist the primary diver.

Day 1 - Difficulties included shallow water, zero visibility, a soft bottom, river currents, air pollution, and an unstable boat ladder.

Day 2 - Difficulties included mobility and stability during shallow water wading, tethered T-bar operation, and buoy handling during sampler insertion.

The dive ladder was replaced on the second day after access difficulties. OTC work boots were employed to assist the wading diver over uneven Cap surfaces. It is recommended that additional balance/stability assists are used during future sampler deployment events. Communication with barge traffic control will be needed for work on the industrial traffic side of the site.

## **REFERENCES**

*EPA R6 Dive Safety Plan: San Jacinto River Waste Pits Superfund Site, Harris County (Channelview) TX (12/08 – 12/11/15)*



